

IN THE CLAIMS

1. (Canceled)

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11. (Previously Presented) A device for matching an antenna impedance in a portable radio telephone that includes transmission and receiving circuits, a foldable casing, the foldable casing movable between an unfolded position and a folded position, and an antenna movable between an

extracted position from the foldable casing and a retracted position into the foldable casing, the device comprising:

means for storing a plurality of digital voltages wherein each digital voltage is associated with a corresponding radio telephone configuration, wherein the configuration is defined by the foldable casing position, the antenna position, and whether the radio telephone is in transmitting mode or receiving mode;

means for determining the foldable casing position, the antenna position, and whether the radio telephone is in transmitting or receiving mode, and for providing a first signal in response thereto; and,

means for matching the impedance of the radio telephone antenna in response to the first signal, wherein the means for matching uses a digital voltage, from among the plurality of digital voltages, corresponding to the first signal.

12. (Previously Presented) A device as claimed in claim 11, wherein the means for matching impedances includes:

a controller for receiving the sensing signal, and for providing the digital voltage corresponding to the first signal;

a digital-to-analog converter for converting the digital voltage into an analog voltage; and

a matching circuit for matching the impedance of the antenna in response to the analog voltage.

13. (Canceled)

14. (Canceled)

15. (Original) A device as claimed in claim 12, wherein the matching circuit includes:
an inductor connected between the antenna and the transmission/reception circuit;
a first capacitor having a first end connected to the inductor and the transmission/reception circuit, and having a second end grounded;
a second capacitor and a variable capacitance diode connected in series between the antenna and ground,
wherein a capacitance of the variable capacitance diode is varied according to the analog voltage.

16. (Previously presented) A device as claimed in claim 12, wherein the matching circuit includes:
an inductor having a first end connected to the antenna and a second end connected to the transmission/reception circuit;
a first capacitor having a first end connected to the second end of the inductor and the transmission /reception circuit, and a second end grounded;
a second capacitor having a first end connected to the antenna and the first end of the inductor, and having a second end connected to ground; and
a variable capacitance diode having a first end connected to the antenna and the first end of the inductor, and having a second end connected to ground,
wherein a capacitance of the variable capacitance diode is varied according to the analog voltage.

17. (Previously Presented) A device for matching an antenna impedance in a portable radio telephone having transmission and receiving circuits, a foldable casing, the foldable casing movable between an unfolded position and a folded position, and an antenna movable between an extracted position and a retracted position, the device comprising:

means for sensing the position of the foldable casing and the antenna, and for providing a sensing signal in response thereto;

means for determining optimal antenna impedance values where each value corresponds with a different radio telephone configuration based on the position of the foldable casing and the antenna and whether the portable radio telephone is transmitting or receiving;

means for storing a voltage corresponding to each of the optimal antenna impedance values;
and

means for matching the antenna impedance based on the sensing signal and a stored voltage corresponding to the sensed position of the foldable casing and the antenna.

18. (Previously Presented) A device as claimed in claim 17, wherein the means for determining optimal impedance values comprises:

means for measuring a reception and transmission signal strength;
means for adjusting a voltage by a fixed increment from 0V to a fixed voltage level;
means for converting the adjusted voltage into an analog voltage;
means for setting the impedance of the antenna according to the analog voltage; and
means for identifying when the means for measuring a reception and transmission signal strength has measured a maximum signal strength, and for determining the analog voltage corresponding to the measured maximum signal strength.

19. (Previously Presented) A device as claimed in claim 18, wherein the means for matching the impedance comprises:

an inductor connected between the antenna and the transmission/reception circuit;

a first capacitor having a first end connected to the inductor and the transmission/reception circuit, and having a second end grounded;

a second capacitor and a variable capacitance diode connected in series between the antenna and ground,

wherein a capacitance of the variable capacitance diode is varied according to the analog voltage.

20. (Previously Presented) A device as claimed in claim 18, wherein the means for matching the impedance comprises:

an inductor having a first end connected to the antenna and a second end connected to the transmission/reception circuit;

a first capacitor having a first end connected to the second end of the inductor and the transmission /reception circuit, and a second end grounded;

a second capacitor having a first end connected to the antenna and the first end of the inductor, and having a second end connected to ground; and

a variable capacitance diode having a first end connected to the antenna and the first end of the inductor, and having a second end connected to ground,

wherein a capacitance of the variable capacitance diode is varied according to the analog voltage.

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40. (Previously presented) The device as claimed in claim 18, wherein the fixed increment is approximately 0.5V.

41. (Previously presented) The device as claimed in claim 18, wherein the fixed voltage level is approximately 255V.

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71. (Previously Presented) A method of adjusting an antenna impedance in a portable radio telephone that includes transmission and receive circuits, a foldable casing enclosing the radio, the foldable casing movable between an unfolded position and a folded position, and an antenna movable between an extracted position from the foldable casing and a retracted position into the foldable casing, said method comprising the steps of:

sensing a configuration of the radio telephone, wherein the configuration is defined by the position of the foldable casing, the position of the antenna and whether the radio telephone is in transmit or receive mode, and providing a sensing signal in response thereto;

measuring a reception/transmission signal strength at a radio frequency for each of a plurality of antenna impedances and for each of a plurality of radio telephone configurations;

determining an optimal antenna impedance for each configuration;

storing a voltage corresponding to the optimal antenna impedance for each configuration; and

setting the antenna impedance based on the stored voltage, according to the sensing signal provided in response to the sensed radio telephone configuration.

72. (Previously Presented) The method of claim 71, wherein the determining step comprises:

adjusting a voltage by a fixed increment from 0V to a fixed voltage level;

converting the adjusted voltage into an analog voltage; and

matching the impedance of the antenna in response to the analog voltage.

73. (Previously Presented) The method of claim 71, wherein the radio frequency is one of a low frequency, a center frequency, and a high frequency in a receiving/transmitting frequency.

74. (Currently Amended) A method for matching an antenna impedance in a portable radio telephone that includes a radio having transmission and receiving circuits, a foldable case enclosing the radio, the foldable case movable between an unfolded position and a folded position, and an antenna movable between an extracted position from the foldable case and a retracted position into the foldable case, said method comprising the steps of:

storing a plurality of values;

sensing whether the antenna is in the ~~extended~~ extracted position in transmitting or receiving mode and [[for]] producing at least one sensing signal in response thereto; [[and]]

selecting one of the plurality of values that corresponds with the sensing signal; and

matching an impedance of the antenna impedance in response to the sensing signal the selected value, wherein the matched impedance corresponds with the impedance of the transmission or receiving circuit.

75. (Previously Presented) A device for matching antenna impedance in a radio telephone that includes a foldable case, said device comprising:

memory for storing a plurality of digital values, each associated with a corresponding telephone configuration, wherein the configuration is defined by the position of the case, the position of the antenna and whether the telephone is transmitting or receiving;

means for sensing the configuration;

means for generating a sensing signal that reflects the sensed configuration;
and

means for matching the antenna impedance based on a selected one of the
stored digital values that corresponds with the sensing signal.

76. (Previously Presented) The device of claim 75, wherein the means for matching
comprises:

a controller for selecting one of the stored digital values the value as a function of the sensing
signal;

digital to analog converter for generating an analog signal corresponding to the one selected
digital value;

an impedance matching circuit; and

means for applying the analog signal to the impedance matching circuit.

77. (Previously Presented). The device of claim 76, wherein said analog
signal represents a voltage.